REMARKS

Election/Restriction

The Examiner has made a restriction requirement in accordance with 35 U.S.C. §121 between:

Species I: Claims 1-28, drawn to a device driver and associated API, classified in class 719, subclass 321.

Species II: Claims 29-41, drawn to a implementation of a software component upon a physical device, classified in class 718, subclass ____100.

In response to the Examiner's restriction requirement, election is hereby made without traverse to prosecute the invention of species I, claims 1-28. Claims 29-41 have been withdrawn.

Claims Rejections - 35 USC §112 Second Paragraph

The Office rejected Claims 1, 3, 5, and 7 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. A §112 second paragraph rejection has two separate requirements, indefiniteness and failing to claim what applicant regards as the invention. With respect to indefiniteness, the "essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of (1) the content of the particular disclosure, (2) the teachings of the prior art, and (3) the claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made." (MPEP §2173.02).

The applicant respectfully submits that the above amendment cure this rejection. The applicant respectfully requests that the Office withdraw its rejection of these claims.

Claims Rejections - 35 USC §102(b)

The Office rejected claims 1 -28 under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,752,032 issued to Keller et al.. A rejection based on anticipation requires that a single reference teach every element of the claim (MPEP § 2131). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Or stated in another way, a "claim is anticipated only if each and every element as set forth in the claim is found, . . . described in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Regarding claim 1, in contrast to the claimed invention, the '032 reference fails to disclose a system for the implementation of integrating physical devices into a software based framework for distributed processing. The '032 reference discloses a set of interfaces (64-72) from an adaptation layer 50 to users 60. The '032 reference achieves this through the operating system 54. The '032 reference provides other interfaces from the adaptation layer to the physical device (76-88). Notably, the physical device interfaces 76-88 of the '032 reference, are not equivalent to the user interfaces 64-72 of the '032 reference. In the '032 reference, in contrast to the claimed invention, the set of interfaces from the adaptation layer to the physical device are organized by, and logically similar to the physical devices (20-29), but the set of interfaces from the adaptation layer to users are organized by operating system interface. Thus, the board driver (74) of the '032 reference performs the logical or semantic transformation of requests at the user interfaces to those of the physical device interfaces. The board driver (74) is configured and supported by hardware interface modules to perform adaptation to specific hardware in the physical device.

Such a configuration is in contrast to the claimed invention, wherein the meaning and organization of the interfaces of the physical device are the same as those of the interface to users. Further, in the claimed invention, the interfaces include six specific interfaces required for

software components in a software based framework for distributed processing, regardless of the processing performed. In contrast, the '032 reference, in column 25 lines 63, states "The hardware interface objects are preferably functionally constrained to support a well defined set of operations specific to a particular type of hardware sub-element." The '032 reference thereby implies specific interfaces, not a generalized interface to the device.

The applicant notes that in the specification of the claimed invention utilizes the phrase "software component" to describe a software application. The applicant further submits that this definition is consistent with the definition used by those skilled in the distributed computing field. A software component in a software based framework for distributed processing is taught in A Tutorial on the Lightweight CORBA Component Model, by Schmidt (Schmidt, Douglas., A Tutorial on the Lightweight CORBA Component Model, http://www.cs.wustl.edu/%7Eschmidt/OMG-CCM-Tutorial.ppt). The CORBA Component Model (CCM) is an example of a software based framework for distributed processing. The CCM is based on configurable software elements known as software components. Further, the CCM is an example having required service interfaces. Five of the six required service interfaces are presented: Communications service: As in the CORBA Component Model (CCM) Receptacles, and Event Sink interfaces Communications Connection service: As in the CCM Receptacles interface Control service: As in the CCM Facets interface, and home interface Behavior service: As in the CCM Attributes interface.

The Engineering service described in the present invention is an extension of the Facets interface of the CCM, but is a common service interface to all components that provides access to diagnostic information used during the development phase of the component lifecycle. The necessity of such a service within systems and components is described in Sanz, being referred to as Reports of types Journals, Logs, and Trends. Sanz, Ricardo. CORBA Control Systems White Paper. http://www.omg.org/docs/realtime/03-11-07.pdf. section 3.4.6

In claimed invention, the software component, as described in the specification, uses the "Container programming model" where the external component interfaces are reflected in the internal interfaces.

The Applicant respectfully draws the Office's attention to reference number 20 in Figure 2B and Figure 3 and to paragraph 50 of the specification of the claimed invention: "The adaptation layer specifies and enforces compatible electrical, physical and logical interfaces between the programmable device and the software-based framework of which the device, the application running on it, and the adaptation layer are a component." Thus the component is not merely any software unit involved in the operation of a system, but is a specific software element, having the requisite six interfaces, which when using the present invention, comprises the adaptation layer and the application. The Office alleges equivalence between the software component of the claimed invention and the kernel layer of the '032 reference. The applicant respectfully submits that this equivalence is erroneous, when the applicant's definition of software component, as articulated in the specification is applied. Instead of a software component comprising a software application with associated adaptation layer, the '032 reference kernel layer 56 refers to the part of the operating system. (See '032 ref, col. 7, ll. 6-9 "The operating system layer 54 typically includes an operating system kernel 56 and potentially one or more operating system extensions 58 that add some basic operating system level functionality. Finally, the operating system layer 54 may in turn support one or more application programs 60.") The applicant respectfully submits that reconsideration of the claims in light of these definitions will allow the Office to reach a more accurate comparison between the claimed invention and the '032 reference.

The applicant therefore submits that the '032 reference fails to disclose:

> A system for the implementation of integrating physical devices into a **software based framework for distributed processing**, said system comprising:
> at least one physical device;
> an adaptation layer, comprising an adaptation layer interface and at least one device object, said device object comprising at least one capability object and one physical

device interface object; said physical device interface object corresponding to and controlling electrical interfaces to said physical device;

at least one software component interface, having a **communication service interface; and**

a control service interface said at least one software component interface having at least **six service interfaces** communicating with said adaptation layer interface; said at least six service interfaces comprising **a deployment service interface; a communication service interface; a communication connection service interface; a control service interface; and a component behavior control interface;**

at least one **software component**, coupled to said software component interface; and

wherein said software component interface controls said physical device through said adaptation layer.

In particular, the applicant notes that the '032 reference fails to disclose a software component interface connecting a software component and through which the adaptation layer controls the physical device. The '032 reference discloses interface modules of the device driver 50, including the OS interface modules, GDI, Direct Draw, D3D, OS interface, Graphics interface and, and shell. These interfaces are not, as in the claimed invention, interfaces between the software component or application and the adaptation layer interface, but instead are interfaces between the adaptation layer and the physical device and are part of the device driver, See Fig. 2 of the '032 reference. The applicant respectfully points out the software component, allegedly present in the '032 reference as item number 54, the software kernel. The applicant respectfully submits that this is a misinterpretation of the "software component" of the claimed invention. Instead, the "software component" is more appropriately associated with the application 60 of the '032 reference. The Applicant notes that the application 60 of the '032 reference fails to contain those six service interfaces required by the claimed invention. Likewise, the application 60 of the '032 reference fails to disclose the communication of those (absent) service interfaces with the adaptation layer interface. Referring to Figure 2 of the '032 reference, the applicant

notes that the application 60 interacts with the operating system, not with the device driver 50 analogous to the adaptation layer of the claimed invention.

The software component of the claimed invention, as noted above, is not merely a piece of software but an application which is a proxy for the processing performed at an accelerated throughput by the physical device; other than processing rate, the claimed invention results in the same behavior of the component whether processing is performed by the hosting computer or by the physical device.

Regarding claim 3, the Office alleges that the '032 reference discloses "at least one software component interface . . . common to said software-based frameworks for distributed computing." The applicant respectfully submits that this is simply not the case. The '032 reference does not disclose a framework for distributed computing. Instead, the '032 reference discloses a single computer operating system. The '032 reference discloses interfaces to support memory allocation, memory management, virtual memory management, input-output device access, and file input-output. Such interfaces are necessary, but are insufficient for a framework of distributed computing, such as that of the claimed invention.

Regarding claim 6, in contrast to the claimed invention, the '032 reference fails to disclose a deployment service interface; a communication service interface; a communication connection service interface; and an engineering service interface. The Office's allegations relate not the software component interface, but to the device driver, which, as noted above is both specific to the physical device and is more appropriately understood to be analogous to the adaptation layer of the claimed invention.

Regarding claims 15 and 16, the '032 reference fails to disclose a system wherein said capability object provides activities for compliance with a software framework for distributed computing, said activities comprising: deployment; control; behavior control; establishment of connections for communications; communication and data transfer; and data sampling and output. In contrast to the claimed invention, the structures cited by the Office in the '032 reference disclose

interface modules for interaction with peripheral devices and not components in a software framework for distributed computing.

Regarding claims 18 and 26, the applicant respectfully submits that the cited '032 reference fails to disclose software components configured to be deployed upon a physical device or devices on a framework for distributed computing. The cited reference fails to disclose such a framework, or to suggest such a framework. The application of the '032 reference is not deployable upon the peripheral elements of the system disclosed in the '032 reference. Simply put, the claimed elements of these claims, and those claims dependant therefrom are not disclosed in the cited reference. The applicant refers the Office to the above arguments made with respect to claim 1.

The applicant therefore, at least for the reasons articulated above the claimed invention of claims 1, 18 and 26, and those claims dependant therefrom, are not unpatentable in light of section 102 of the statute. The applicant respectfully requests that the Office withdraw its rejection of the claimed invention.

Telephone Interview

Present Office policy places great emphasis on telephone interviews initiated by the examiner. For this reason, it is not necessary for an attorney to request a telephone interview. Examiners are not required to note or acknowledge requests for telephone calls or state reasons why such proposed telephone interviews would not be considered effective to advance prosecution. However, it is desirable for an attorney to call the examiner if the attorney feels the call will be beneficial to advance prosecution of the application. MPEP§408

Applicant believes the above amendments and remarks to be fully responsive to the Office Action, thereby placing this application in condition for allowance. No new matter is added. Applicant requests speedy reconsideration, and further requests that Examiner contact its

attorney by telephone, facsimile, or email for quickest resolution, if there are any remaining issues.

Respectfully submitted,

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